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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,372	08/10/2001	Jun Nakagawa	110106	2666
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OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER PAPPAS, PETER	
			ART UNIT 2628	PAPER NUMBER
			MAIL DATE 09/20/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

09/889,372

**Applicant(s)**

NAKAGAWA, JUN

**Examiner**

Peter-Anthony Pappas

**Art Unit**

2628

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,10-12,20-22 and 27-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,10-12,20-22 and 27-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 30 and 31 are objected to because of the following informalities: the respective claim language "The program" should be replaced with "The computer readable medium". Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 11, 12, 20, 30 and 31 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal (e.g., carrier wave), it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored in a computer-readable medium, in a computer, on an electromagnetic carrier signal does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer.").

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 10-12, 20-22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al. (Computer Graphics: Principles and Practice) in view of Ray et al. (U.S. Patent No. 5, 764, 231), Deering (Pub. No. US 2003/0011618 A1) and Griffin (U.S. Patent No. 5, 990, 904).

6. In regard to claim 1 Foley et al. teaches a high-level conceptual framework which can be used to describe almost any interactive graphics system (p. 17, §1.6.1; Fig. 1.5). Foley et al. teaches that a raster display system, with a peripheral display processor, is a common architecture that avoids the disadvantages of the simpler raster display by introducing a separate graphic processor to perform graphics functions. Said system includes a CPU, system memory, a display processor and display processor memory, all of which are interconnected via a system bus (p. 170, § 4.3.2; Fig. 4.22). It is noted said system memory is considered to store a program and data for image generation and said display processor is considered to perform the processing for image generating.

Foley et al. teaches that at times one might want the view volume to be finite, in order to limit the number of output primitives projected on the view plane. This can be accomplished through the use of a front clipping plane and a back clipping plane (p. 240, ¶ 2).

Foley et al. teaches that depth cueing, seen as a simplified version of the effects of atmospheric attenuation, exploits the fact that distant objects (objects intended to

appear farther from a viewer) appear dimmer than closer object. In depth cueing interpolation occurs between the color of a given primitive (color of a given object as represented by its primitive) and a user-specified depth-cue (target) color (p. 610-611, §14.3.4; p. 727-728, §16.1.3; p. 1044-1046, §20.8.2). Foley et al. illustrates a depth cueing area in Color Plate II.24 and Color Plate II.25. It is implicitly taught by Foley et al. that said depth cueing area depends, at least to some degree, on a viewpoint as said scenes in Color Plate II.24 and Color Plate II.25 contain various graphical information displayed from a given viewpoint. In addition it is noted that said Color Plates are considered to comprise objects in both the background and foreground.

Foley et al. fails to explicitly teach said depth cueing area only being set near a backward clipping plane. Ray et al. teaches a method and apparatus in which a geometric image of an object to be rendered as a depth image is created (Abstract). Ray et al. teaches rendering a scene with the back clipping plane set to contain the look-at-point, that is, only render objects in front of the image plane (col. 8, lines 56-64). It would have been obvious to one skilled in the art, at the time of the Applicant's invention, to incorporate the teachings of Ray et al. into the system taught by Foley et al., because through such incorporation it would allow for greater control of how much of said view volume to render resulting in greater efficiency as the whole view volume would not necessarily need to be rendered at all times.

Foley et al. and Ray et al. fail to explicitly teach varying an alpha value of the object so that the object being more distant from the viewpoint becomes more transparent. Deering teaches that simple fogging is a special case of alpha blending, in

which the degree of alpha changes with distance (depth) so that the object appears to vanish into a haze (alpha varies), as the object moves away from the viewer. This simple fogging may also be referred to as depth cueing or atmospheric attenuation (p. 1, ¶ 11). It would have been obvious to one skilled in the art, at the time of the applicant's invention, to combine the teachings of Foley et al. and Deering in regard to the details of depth cueing and atmospheric attenuation (e.g., haze), because Deering teaches how atmospheric attenuation can be achieved in regard to varying an alpha value and thus serves to further clarify the application of atmosphere attenuation to a given area when utilized in a given graphic systems.

Foley et al., Ray et al. and Deering fail to explicitly teach sorting objects of which alpha values are varied so that the objects are drawn in succession starting from an object nearest to the viewpoint and performing hidden-surface erasing based on a Z-buffer process for the objects of which alpha values are varied. Griffin teaches an improved method and a hardware system for merging pixel fragments, allowing for a reduction of memory usage in a given graphics rendering system (col. 4, lines 66-67; Abstract). Griffin teaches that said system utilizes Z-buffering, which has the advantages of computational speed and simplicity (col. 9, lines 55-57; col. 3, lines 48-49). Griffin further teaches that color and alpha are accumulated using a front to back approach and that for hardware implementations front to back is preferable because the resolve process is less hardware intensive (col. 42, lines 10-67; col. 43, lines 1-46). Griffin further teaches that said system supports a wide range of interactive

applications. Its ability to support advanced real time animation makes it well-suited for games, educational applications, and a host of interactive applications (col. 7, lines 1-5).

Foley et al., Ray et al. and Deering fail to explicitly teach varying a depth cueing value for each vertex of the object based on a Z-value for each vertex of the object and varying the alpha value for each vertex of the object based on the Z-value for each vertex of the object. Griffin teaches that the method begins by queuing primitives in the set-up block 383. The vertex input processor 384 parses the input data stream and queues triangle data in the vertex control registers 387 (961, 962). The scan convert block 397 reads the geometric primitives queued in the set-up block. The scan convert block 397 performs pixel generation operations as soon as requested texture data is available in the texture cache 402. The pixel engine 406 performs pixel level calculations including hidden surface removal and blending operations. To perform hidden surface removal, the pixel engine 406 compares depth values for incoming pixels (fully covered pixels or pixel fragments) with pixels at corresponding locations in the pixel or fragment buffers. After performing the pixel level calculations, the pixel engine stores the appropriate data in the pixel or fragment buffers (col. 32, lines 55-67; col. 33, lines 1-37). As illustrated in Fig. 9A-9B said pixel information is generated from said vertex information and thus said pixel information is considered to represent said vertex information.

Griffin further teaches that the merge test blocks 1000-1008 compare the depth, color and alpha components for new and previous pixel fragments, and if the new and previous values are within a predetermined tolerance, they output a bit indicating that

the new pixel fragment is a merge candidate. The pixel engine then performs a bitwise AND (1010) to determine whether each of the merge tests has passed. If so, the pixel engine merges the new and previous pixel fragments. The pixel engine can attempt to merge an incoming pixel fragment only with the pixel fragment closest to the viewpoint (with lowest z value) or can attempt to merge with several pixel fragments stored for a pixel location (col. 37, lines 48-67; col. 38, lines 1-20). It is noted that the merging or insertion of fragments would result in the modification or creation, respectively, of depth and alpha values.

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to incorporate the teachings of Griffin into the system taught by Foley et al., Ray et al. and Deering, because through such an incorporation the amount of memory required for the storage of the image data within the graphics system would be reduced, thus requiring less physical memory to be implemented or allocated within said graphics system for the storage of said image data, while at the same time said incorporation would utilize conventional graphic techniques, such as a Z-buffer, which would not require specialized hardware to be implemented.

Foley et al. teaches a viewing means by which rendered (drawn) objects are viewed dependent on a given perspective projection, wherein the presented view of said objects change in accordance with the change of said perspective projection. The visual effect of said perspective projection is similar to that of photographic (camera) systems (p. 230-236, § 6.1). Foley et al. also teaches a synthetic camera (p. 299-302, § 7.3.4).



7. In regard to claim 2 the rationale disclosed in the rejection of claim 1 is incorporated herein. In depth cueing interpolation occurs between the color of a given primitive (color of a given object as represented by its primitive) and a user-specified depth-cue (target) color (Foley et al. – p. 610-611, §14.3.4; p. 727-728, §16.1.3; p. 1044-1046, §20.8.2). It is noted that the interpolation between said primitive color and said user-specified depth-cue color is considered to yield a spectrum of colors, wherein said spectrum of colors is a combination of (different from) said primitive color and said user-specified depth-cue color.

8. In regard to claim 10 the rationale disclosed in the rejection of claim 1 is incorporated herein.

9. In regard to claim 11 Foley et al. teaches that the graphics system is thus an intermediary between the application program and the display hardware (p. 17-19, § 1.6.1-1.6.2). The rationale disclosed in the rejection of claim 1 is incorporated herein.

10. In regard to claim 12 the rationale disclosed in the rejection of claim 2 is incorporated herein.

11. In regard to claim 20 Foley et al. teaches that the graphics system is thus an intermediary between the application program and the display hardware (p. 17-19, § 1.6.1-1.6.2). The rationale disclosed in the rejection of claim 1 is incorporated herein.

12. In regard to claim 21 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.

13. In regard to claim 22 the rationale disclosed in the rejection of claim 2 is incorporated herein.

Art Unit: 2628

14. In regard to claim 27 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.

15. In regard to claims 28-33 the rationale disclosed in the rejection of claim 1 is incorporated herein (Griffin – col. 32, lines 55-67; col. 33, lines 1-37; col. 37, lines 48-67; col. 38, lines 1-20). It is noted said depth values for incoming pixels are considered to read on depth cueing values and as such a respective depth value would increase/decrease as processing is performed along the Z-axis accordingly. It is noted said processing is considered to be performed by said processor.

#### ***Response to Amendment***

16. The prior claim objection has been withdrawn in lieu of Applicant's remarks.

17. The prior 35 U.S.C. 101 rejection has been withdrawn in lieu of Applicant's remarks.

18. Applicant's remarks have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter-Anthony Pappas whose telephone number is 571-272-7646. The examiner can normally be reached on M-F 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2628

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Peter-Anthony Pappas  
Examiner  
Art Unit 2628

PP

  
ULKA CHAUHAN  
SUPERVISORY PATENT EXAMINER